

TABULATED DATA

WALER SYSTEMS



SPEED  SHORE®

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WARNING

EXCAVATION PROCEDURES MAY BE VERY DANGEROUS

- A TRAINED *COMPETENT PERSON* SHALL: SUPERVISE ALL EXCAVATION OPERATIONS, ENSURE THAT ALL PERSONNEL ARE WORKING IN SAFE CONDITIONS, AND HAVE THOROUGH KNOWLEDGE OF THIS TABULATED DATA. THE *COMPETENT PERSON* SHALL HAVE THE AUTHORITY TO STOP WORK WHEN IT IS UNSAFE FOR WORKERS TO ENTER AN EXCAVATION.
- ALL PERSONNEL SHALL BE TRAINED IN CORRECT EXCAVATION PROCEDURES, PROPER USE OF THE PROTECTIVE SYSTEM AND ALL SAFETY PRECAUTIONS.
- EXCAVATIONS AND PROTECTIVE SYSTEMS SHALL BE INSPECTED AT LEAST DAILY AND WHENEVER THERE IS A CHANGE OF SOIL, WATER OR OTHER JOB SITE CONDITIONS.
- ALL LIFTING AND PULLING EQUIPMENT, INCLUDING CABLES, SLINGS, CHAINS, SHACKLES AND SAFETY HOOKS SHALL BE EVALUATED FOR SUITABILITY AND CAPACITY, AND SHALL BE INSPECTED FOR DAMAGE OR DEFECTS PRIOR TO USE.
- ALL INSTALLATION AND REMOVAL OF SHORING AND SHIELDING SHALL BE FROM ABOVE GROUND ONLY.
- DO NOT ALLOW PERSONNEL TO ENTER AN EXCAVATION THAT IS NOT PROPERLY SHORED, SHIELDED OR SLOPED.
- PERSONNEL SHALL ALWAYS WORK WITHIN THE SHORING AND SHIELDING. PERSONNEL SHALL NOT STAND ON THE EDGE OF AN UNSHORED EXCAVATION.
- ALL PERSONNEL SHALL ENTER AND EXIT EXCAVATIONS ONLY WITHIN SHIELDED OR SHORED AREAS.

SPEED SHORE'S "MANUFACTURER'S TABULATED DATA" IS A GENERAL SET OF GUIDELINES AND TABLES TO ASSIST THE *COMPETENT PERSON* IN SELECTING A SAFETY SYSTEM AND THE PROPER SHORING OR SHIELDING EQUIPMENT. THE *COMPETENT PERSON* HAS SOLE RESPONSIBILITY FOR JOB SITE SAFETY AND THE PROPER SELECTION AND INSTALLATION AND REMOVAL OF THE SHORING OR SHIELDING EQUIPMENT.

THIS TABULATED DATA IS NOT INTENDED TO BE USED AS A JOB SPECIFIC EXCAVATION SAFETY PLAN, BUT SHALL BE USED BY THE *COMPETENT PERSON* TO SUPPLEMENT HIS TRAINING, HIS EXPERIENCE AND HIS KNOWLEDGE OF THE JOB CONDITIONS AND SOIL TYPE.



SPEED SHORE
TABULATED DATA

1.0 SCOPE

- 1.1 Speed Shore's Tabulated Data complies with the O.S.H.A. standards as stated in the Code of Federal Regulations 29, Part 1926, Subpart P - Excavations, Section 1926.652(c)(2). This data shall only be used by the contractor's *competent person* in the selection of Wales and sheeting for Speed Shore Waler Systems. The *competent person* shall be experienced and knowledgeable in trenching and excavation procedures, soil identification and in the use of Speed Shore Waler Systems.
- 1.2 All personnel involved in the installation, removal and use of Waler Systems shall be trained in their use and advised of appropriate safety procedures. All operating instructions must be followed.
- 1.3 Table W-1, W-2 and W-3 are based upon requirements stated in CFR 29, Part 1926 and applicable portions of CFR 29, Part 1910. The *competent person* shall know and understand the requirements of those parts before using this data.
- 1.4 Whenever there is a variance between this Tabulated Data and CFR 29, Part 1926, Subpart P - Excavations, this Tabulated Data shall take precedence. Whenever a topic or subject is not contained in this Tabulated Data, the *competent person* shall refer to CFR 29, Part 1926, Subpart P - Excavations.
- 1.5 Tables W-1, W-2 and W-3 shall be used only in typical excavations with soil conditions as noted. Table W-1, W-2 and W-3 are for depths to 20 feet. For other soil and excavation conditions and depths, site-specific engineered designs are required. Contact Speed Shore Corporation for assistance
- 1.6 This Tabulated Data is applicable for standard products manufactured exclusively by Speed Shore Corporation and may only be used with Speed Shore manufactured products. Any modification or repair of Speed Shore products not specifically authorized by Speed Shore Corporation voids this data.
- 1.7 This data refers to the Code of Federal Regulations, 29, Parts 1910 and 1926. In states that have their own state O.S.H.A. refer to similar regulations in the current construction rules published by the state office of Occupational Health and Safety.
- 1.8 This Data is for Waler Systems with hydraulic cylinders only and does not include Waler Systems with Speed Struts.

2.0 DEFINITIONS (RE: CFR 29, Part 1926.32 Definitions) - RESTATED FOR EMPHASIS

- 2.1 1926.32 (f) "competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees; and who has authorization to take prompt corrective measures to eliminate them.
- 2.2 1926.32 (p) "Shall" means mandatory.

3.0 SOIL CLASSIFICATIONS

- 3.1 In order to use the data presented in Tables W-1 and W-3 the soil type, or types, in which the excavation is cut, shall first be determined by the *competent person* according to the O.S.H.A. soil classifications as set forth in CFR 29, Part 1926, Subpart P, Appendix A.
- 3.2 Table W-2 is also for Waler use in Type C-60 soil (see 3.3 for definition).
- 3.3 Type C-60 soil is a moist, cohesive soil or a moist dense granular soil, which does not fit into Type A or Type B classifications, and is not flowing or submerged. This material can be cut with near vertical sidewalls and will stand unsupported long enough to allow the Walers to be properly installed. The *competent person* must monitor the excavation for signs of deterioration of the soil as indicated by, but not limited to, freely seeping water or flowing soil entering the excavation around or below the sheeting. An alternate design for less stable Type C soil will be required where there is evidence of deterioration.

4.0 PRESENTATION OF INFORMATION

- 4.1 Information is presented in tabular form in Tables W-1, W-2 and W-3. Table W-1 is for O.S.H.A. Type A & B Soil, Table W-2 for Waler use in Type C-60 soil (see 3.3 for definition). Table W-3 is for Waler use in O.S.H.A. Type C soil.
- 4.2 Tables W-1, W-2 and W-3 are not considered adequate when loads imposed by structures, or by stored material adjacent to the trench, weigh in excess of the load imposed by 3 feet of soil surcharge. The term "adjacent" as used here means the area within a horizontal distance from the edge of the trench equal to the depth of the trench.
- 4.3 Using the appropriate table, the *competent person* selects the horizontal spacing of the Waler model and the sheeting required. The selection is based on the depth and width of the trench in varying soil conditions. In tables W-1, W-2, and W-3 the vertical spacing of the cylinders is held constant at a maximum of 4 feet on center.

5.0 BASIS AND LIMITATIONS OF THE DATA

- 5.1 The following sheeting materials, or approved equal, may be used as noted in Tables W-1, W-2 and W-3:
 - 5.1.1 Aluminum: Speed Shore's Aluminum Sheeting
 - 5.1.2 Timber: Sizes noted in Tables W-1, W-2, and W-3. Species shall be Douglas Fir with a minimum bending strength (F_b) of 1,500 p.s.i. or Oak with a F_b of 850 p.s.i. Douglas Fir Timber is S4S nominal dimension and Oak Timber is rough cut dimension.
 - 5.1.3 Steel: 1/2 inch or thicker Steel Plate
 - 5.1.4 Plywood:
 - 3/4 inch Finn Form
 - 3/4 inch Omni Form
 - 3/4 inch Combi Exterior Plywood
 - 3/4 inch 14 Ply Artic White Birch
 - 3/4 inch Plyform American Plywood Association, Plyform, B - B, Class I Exterior
 - 3/4 inch HDO American Plywood Association, High Density Overlay, Exterior
 - 1 1/8 inch CDX
 - Two sheets of 3/4 inch thick CDX
- 5.2 All spacing indicated is measured from center to center of the hydraulic cylinders.
- 5.3 The center line of the top Walers shall be a minimum of 12 inches and a maximum of 24 inches below the top of the excavation.
- 5.4 The center line of the bottom Waler shall be a maximum of 4 feet above the bottom of the excavation in Tables W-1, W-2. In Table W-3 the bottom Waler shall be a maximum of 4 feet above the bottom of the excavation if the sheeting is over-driven 12 inches. If the sheeting is not over-driven, the bottom Waler shall be a maximum of 2 feet, 6 inches above the bottom of the excavation.
- 5.5 The sheeting directly behind the end of each hydraulic cylinder must bear on firm soil or a solid and stable filler to distribute the cylinder load to the face of the excavation. Do not butt Waler rails back to back across an excavation.
- 5.6 When the length of the excavation is long enough to allow Walers to be placed end to end, the ends of the Walers shall not be more than 6 inches apart.
- 5.7 The maximum vertical spacing between center lines of Walers shall be 4 feet.
- 5.8 The faces of the excavation must be cut near vertical and straight.
- 5.9 In excavations 6 feet deep or less, 1 Wale is required in each vertical plane. The Wale shall be no more than 4 feet above the bottom of the excavation and no more than 2 feet below the top of the excavation. In excavations over 6 feet deep, there shall be a minimum of 2 Walers stacked one above the other as a unit. In excavation deeper than 10 feet, there shall be more than 2 Walers to comprise a vertical unit.
- 5.10 In short trenches that are only long enough for 1 Wale length the maximum horizontal length of the excavation: 8 feet for a 4 feet Waler, 10 feet for a 6 feet Waler, 12 feet for an 8 Waler, 16 feet for a 12 feet Waler, and 20 feet for a 16 feet Waler.



- 5.11 The ends of trenches shall be shored or sloped in accordance with Appendix B of CFR 29, Part 1926 Subpart P Excavations.
- 5.12 No vertical loads shall be applied to the hydraulic cylinders.
- 5.13 Water flowing into an excavation, from either above or below ground, will cause a decrease in the stability of the soil. Therefore, the **competent person** shall take action to prevent water from entering the excavation and promptly remove any water that accumulates in the excavation. Closer monitoring of the soil is required under wet conditions, particularly in less cohesive (weaker) soil conditions. A small amount of water in any excavation may downgrade the soil classification to a less stable classification. A large amount of water, or flowing conditions, may downgrade all soils to O.S.H.A. Type C. Speed Shore shoring and shielding systems may be used safely in wet conditions when the excavation is monitored by the **competent person**. Example: When repairing a leak in utility lines, it is often difficult or even impossible, to keep water out of the excavation.
- 5.14 Tables W-1, W-2 and W-3 are for standard Speed Shore Waler models W8, WM8, WH8, W12, WM12, WH12, W16, WM16 and WH16. “W” is standard Waler (section modulus 3.67 cubic inches), “WM” is medium duty Waler (section modulus 9.71 cubic inches), and “WH” is heavy duty Waler (section modulus 14.5 cubic inches). The lengths of the Walers are 8, 12 and 16 feet long.
- 5.15 Tables W-1, W-2 and W-3 do not include Wales with Speed Struts. See Tabulated Data, “Waler Systems with Speed Struts”.

6.0 INSPECTION

- 6.1 The **competent person** must evaluate the soils to assure the rated capacity of the Waler Systems is not exceeded by the lateral pressure of the soil. Soils shall be evaluated in accordance with Part 3.0.
- 6.2 The **competent person** shall monitor all phases of the assembly, installation and use of this product to evaluate and eliminate methods, which could endanger employees utilizing this product.
- 6.3 Daily inspections of the Waler Systems and accessories must be performed by the **competent person** and deficiencies corrected.
- 6.4 Inspections shall be conducted as necessary for hazards associated with: water accumulation, changing soil conditions, or changing site weather conditions.

7.0 EXAMPLE TO ILLUSTRATE THE USE OF TABLES W-1, W-2 and W-3:

Problem: Design a trench safety system using Speed Shore Waler Systems with hydraulic cylinders for an excavation 8 feet deep and 4 feet wide in O.S.H.A. Type C soil.

Study tables: Select Table W-3 for O.S.H.A. Type C soils. Look in the column “Depth of Excavation” on line 0 to 12 feet. Next, read across for Maximum Vertical Spacing of 4 feet. Next, locate three alternatives under “Waler Model”. WM8, WH8 and WH16. Models WM8 and WH8 has a maximum horizontal spacing of 6.5 feet and model WH16 has a maximum horizontal spacing of 7.25 feet between hydraulic cylinders. Reading further across under “Width of Excavation”, 0 to 8 feet, find 2 inch diameter hydraulic cylinders for all three alternatives. Sheeting notes 9 and 10 apply.

Conclusion: Any 1 of 2 Speed Shore Waler models WH8 or WH16 may be installed with 2 inch hydraulic cylinders at 4 feet vertical spacing. Sheeting is a minimum of 3x8 timbers at close spacing (or equivalent sheeting). (See Notes 9 and 10).



**WALER SYSTEMS WITH HYDRAULIC CYLINDERS
(Speed Strut models not included in these tables)**

TABLE W-1 TYPE "A" AND "B" SOILS

Depth of Excavation <i>FEET</i>	WALER			HYDRAULIC CYLINDERS			Sheeting (Note 3)		
	Maximum Vertical Spacing (Note 4) <i>FEET</i>	Waler Model (Note 11)			Maximum Horizontal Spacing (Note 2) <i>FEET</i>	Width of Excavation <i>FEET</i>			
		W	WM	WH		0 to 8		8 to 12	12 to 15
0 to 12	4	8	8	8	6.50	2" dia.	2" dia.	2" dia. (Note 1)	
		16	16	16	7.25				
		12	12	12	10.50				
0 to 15	4	8	8	8	6.50	2" dia.	2" dia.	2" dia. (Note 1)	
		16	16	16	7.25				
		-	-	12	10.50				
0 to 20	4	-	8	8	6.50	2" dia.	2" dia. (Note 1)	2" dia. (Note 1)	
		-	16	16	7.25	2" dia.	3" dia.	3" dia.	
		-	-	12	10.50	2" dia.	2" dia. (Note 4)	2" dia. (Note 1)	

(See notes on page 7 of 8)

TABLE W-2 TYPE "C-60" SOILS (See 3.3 for definition of C-60 Soil)

Depth of Excavation <i>FEET</i>	WALER			HYDRAULIC CYLINDERS			Sheeting		
	Maximum Vertical Spacing (Note 4) <i>FEET</i>	Waler Model (Note 11)			Maximum Horizontal Spacing (Note 2) <i>FEET</i>	Width of Excavation <i>FEET</i>			
		W	WM	WH		0 to 8		8 to 12	12 to 15
0 to 12	4	8	8	8	6.50	2" dia.	2" dia.	2" dia. (Note 1)	
		16	16	16	7.25				
		12	12	12	10.50				
0 to 15	4	-	8	8	6.50	2" dia.	2" dia.	2" dia. (Note 1)	
		-	-	16	7.25	2" dia.	3" dia.	3" dia.	
		-	-	12	10.50	2" dia.	2" dia.	2" dia.	
0 to 20	4	-	-	8	6.50	2" dia.	(Note 1)	(Note 1)	
		-	-	16	7.25	3" dia.	3" dia.	3" dia.	
		-	-	12	10.50				

(See notes on page 7 of 8)



**WALER SYSTEMS WITH HYDRAULIC CYLINDERS
(Speed Strut models not included in these tables)**

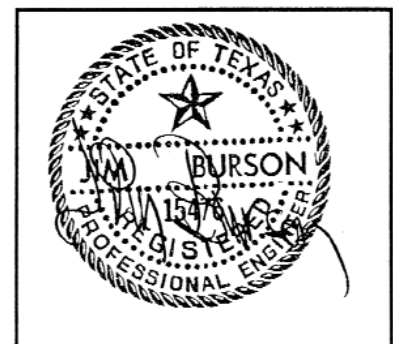
TABLE W-3 TYPE "C" SOILS

Depth of Excavation <i>FEET</i>	WALER				HYDRAULIC CYLINDERS			Sheeting	
	Maximum Vertical Spacing (Note 4) <i>FEET</i>	Waler Model (Note 11)			Maximum Horizontal Spacing (Note 2) <i>FEET</i>	Width of Excavation <i>FEET</i>			
		W	WM	WH		0 to 8	8 to 12		12 to 15
0 to 12	4	-	8	8	6.50	2" dia.	2" dia.	2" dia (Note 1)	(Notes 9 and 10)
		-	-	16	7.25	2" dia.	2" dia.(Note 1)	3" dia.	
0 to 15	4	-	-	8	6.50	2" dia.	2" dia.	2" dia (Note 1)	
		-	-	16	7.25				
0 to 20	4	-	-	8	6.50	3" dia.	3" dia.	3" dia.	

(See notes on page 7 of 8)

NOTES TO TABLES W-1, W-2 and W-3

- (1) 2 inch diameter cylinders shall have a structural steel tube oversleeve 3.5 x 3.5 x 0.1875 inch (installed over the aluminum oversleeve extension) or 3 x 3 x 0.1875 inch (installed without the aluminum oversleeve) that extends the full retracted length of the cylinder. **CAUTION:** In either case, the aluminum load transfer plug and the aluminum innersleeve shall be used or a steel load transfer plug shall be welded securely in place inside the steel oversleeve to transfer the load through the steel oversleeve to the socket pad. Other Speed Shore approved oversleeves may be used.
- (2) Dimensions shown are the maximum horizontal spacing of hydraulic cylinders within each Waler.
- (3) The bottom of the sheeting shall extend within 2 feet of the bottom of the excavation. If there is an indication of a possible loss of soil from behind or below the support system, sheeting must extend to the bottom of the excavation.
- (4) The bottom Waler shall be a maximum of 4 feet above the bottom of the excavation.
- (5) Four feet wide plywood sheeting at close spacing or 2 x 8 inch timber sheeting at 2 feet on center spacing is required if raveling or sloughing of the face of the excavation appears likely to occur.
- (6) Four feet wide plywood sheeting at close spacing or 2 x 8 inch timber sheeting at close spacing is required.
- (7) 2 x 8 inch timber sheeting at close spacing shall extend to the bottom of the excavation.
- (8) 3 x 8 inch timber sheeting at close spacing shall extend to the bottom of the excavation.
- (9) The bottom Waler shall be a maximum of 4 feet above the bottom of the excavation if the sheeting is over-driven 12 inches. If the sheeting is not over-driven, the bottom Waler shall be a maximum of 2 feet, 6 inches above the bottom of the excavation.
- (10) 3 x 8 inch timber sheeting at close spacing shall be over-driven a minimum of 12 inches into the bottom of the excavation or extend to the bottom of the excavation to match the Waler spacing in Note 9.
- (11) Speed Strut models not included in these tables.



EXAMPLES OF TYPICAL INSTALLATION

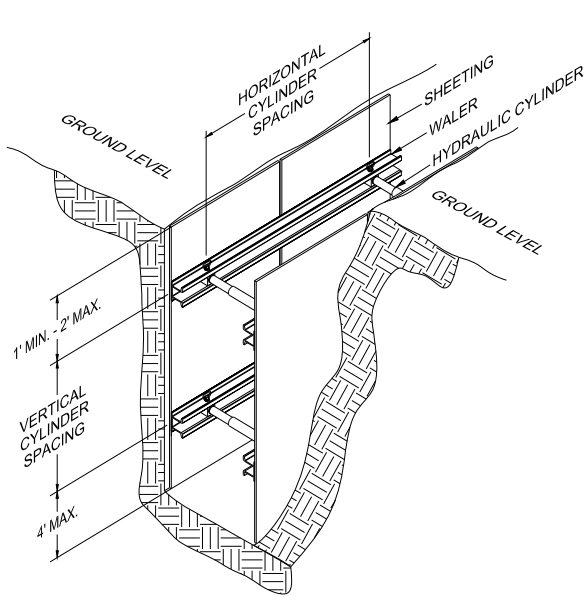


FIG. 1
WITH PLYWOOD SHEETING

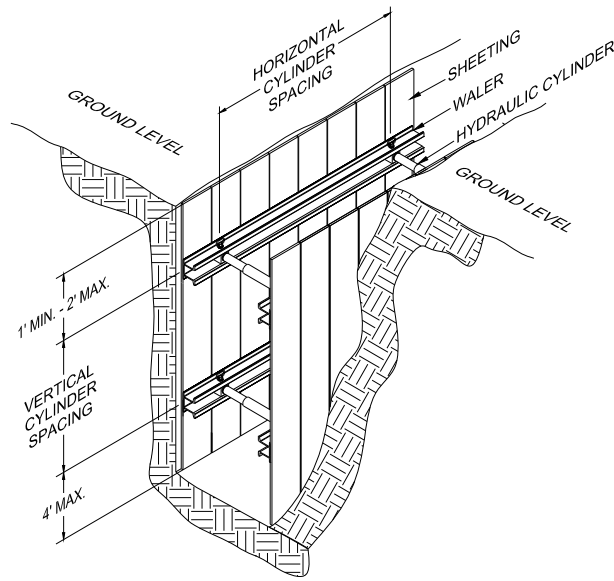


FIG. 2
WITH TIMBER SHEETING

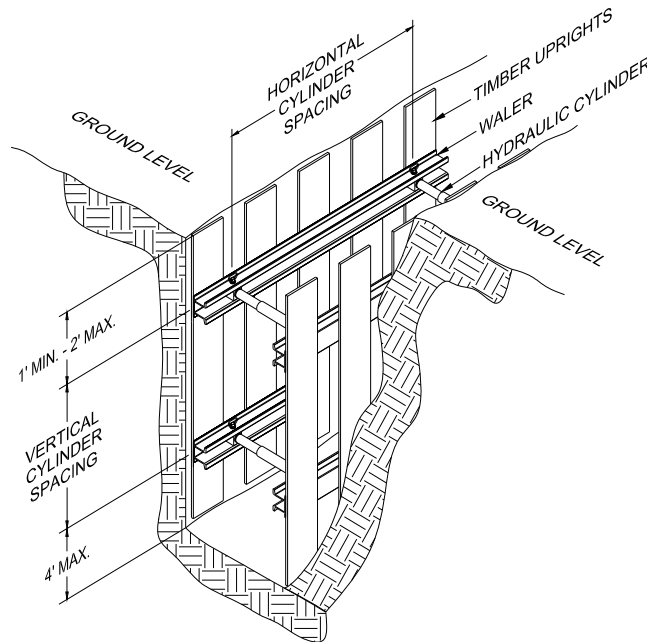


FIG. 3
WITH SPACED TIMBER SHEETING